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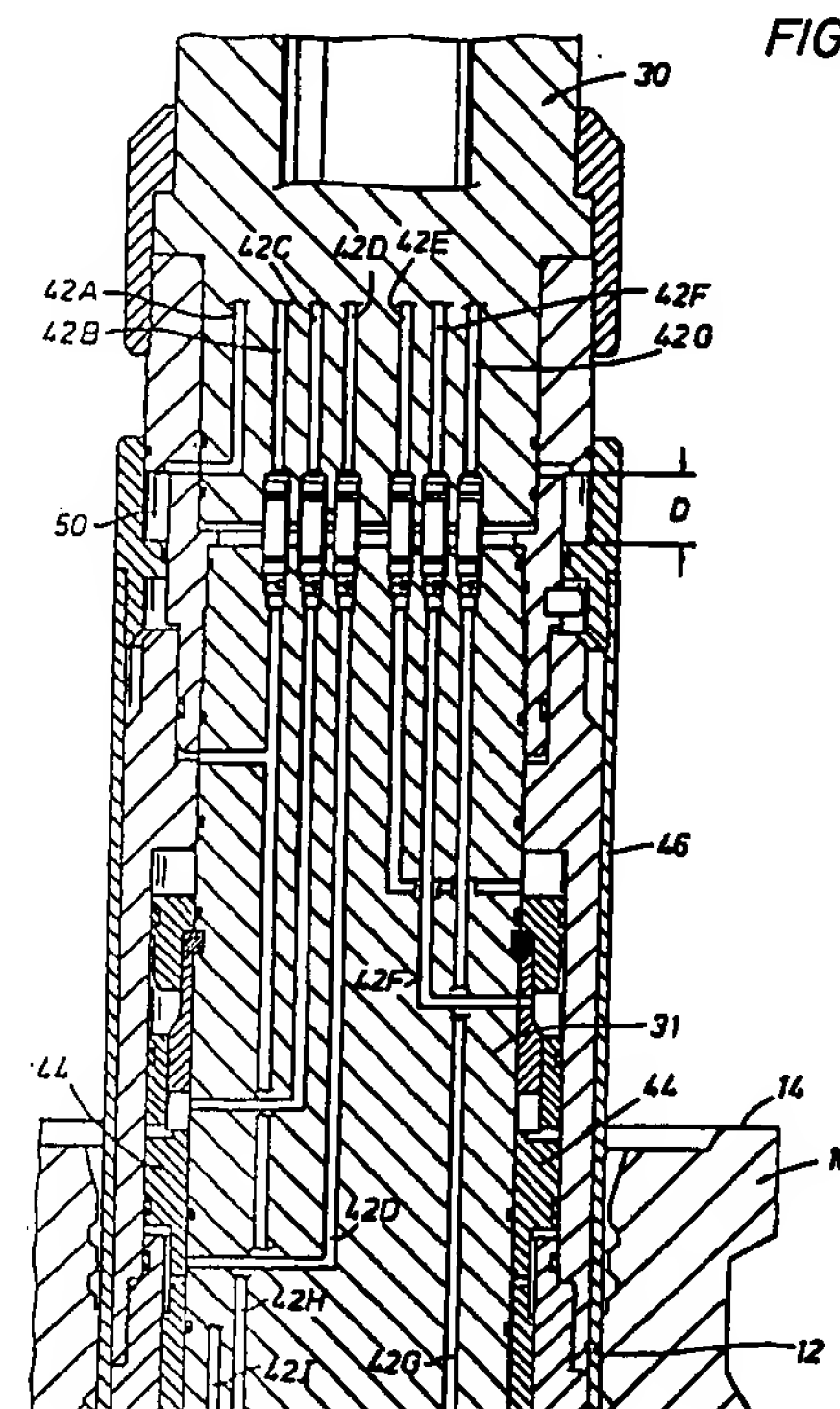
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**(54) Fluid circuitry for a tubing hanger**

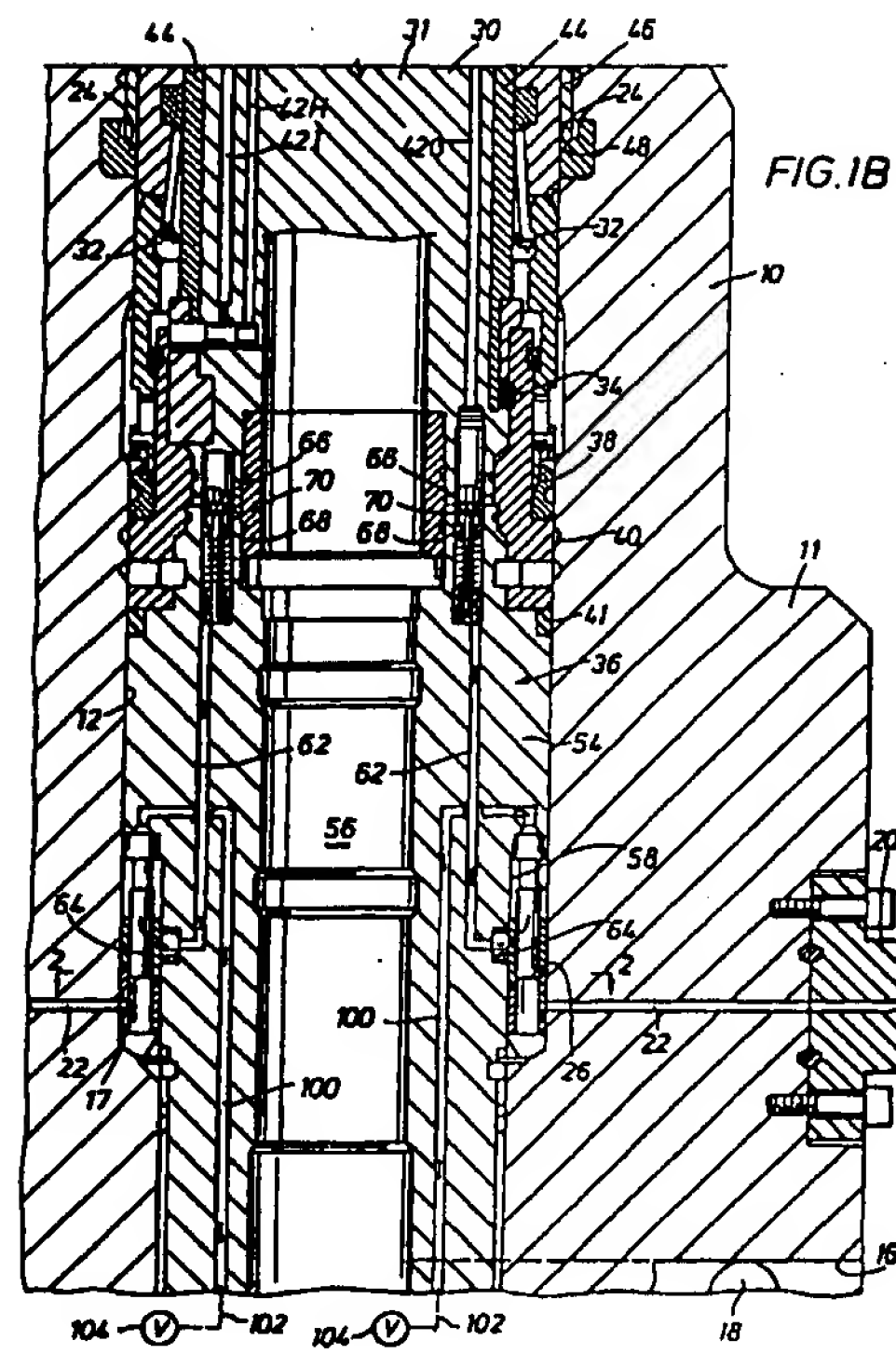
(57) Wellhead completion apparatus includes a wellhead member (11) having an upper supporting shoulder (24) and a lower landing shoulder (26). A running tool (30) is releasably connected to a tubing hanger (36) for lowering and landing the tubing hanger (36) on the wellhead member (11). A fluid coupling (66, 68, 70) is provided between the running tool (30) and the tubing hanger (36). Another fluid coupling (17, 60, 84) is provided between the tubing hanger (36) and the wellhead member (11). The running tool (30) has a body (31) connected to the tubing hanger (36) and an outer sleeve (46) of the running tool (30) is adapted for initial seating on upper supporting shoulder (24) of the wellhead member (11). After the initial seating of sleeve (46) on upper supporting shoulder (24), running tool (30) and tubing hanger (36) are moved downwardly relative to external sleeve (46) for landing of the tubing hanger (36) onto the lower landing shoulder (26) of the wellhead member (11). Hydraulic fluid is provided from the running tool (30) to the tubing hanger (36) during lowering of the tubing hanger (36) as shown in Figure 5. Upon downward movement of tubing hanger (36) after the seating of running tool sleeve (46) on upper supporting shoulder (24) the supply of fluid is transferred from the tubing hanger (30) to the wellhead member (11) as shown in Figure 6. The auxiliary control fluid passage (62) to the running tool (30) is blocked by the wellhead ring (17) defining the lower landing shoulder (26). An embodiment shown in Figures 7-9 permits a wellhead ring (17A) which is secured to the wellhead member

(11A) to be sealed by O-rings (76A, 78A) along planar surfaces (13A, 75A) about the control fluid passage (22A) in the wellhead member (11A).



**FIG. 1A**

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# EUROPEAN SEARCH REPORT

Application Number  
EP 97 30 9593

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 5 244 038 A (WATKINS) 14 September 1993 * column 6, line 24 - line 39 * ---	1,4,10, 15,21	E21B33/04
A	US 4 449 583 A (LAWSON) 22 May 1984 * column 3, line 26 - line 34 * * column 6, line 29 - line 34 * * column 7, line 34 - line 42 * -----	1,4,10, 15,21	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E21B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 February 1999	Examiner Rampelmann, K
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... &amp; : member of the same patent family, corresponding document</p>			

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ON EUROPEAN PATENT APPLICATION NO.

EP 97 30 9593

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11-02-1999

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